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Optimization of support technology for the production of industrial microspheric alumina-chromia catalysts for paraffin dehydrogenation

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Abstract

A systematic physical and chemical analysis of different industrial microspherical supports based on thermochemically activated aluminum trihydrate (TCA-ATH) has been performed in order to improve and optimize supports for the production of isobutane dehydrogenation alumina-chromia catalysts. It has been demonstrated that the phase composition of TCA-ATH products and their structure plays an important role in their synthesis of catalysts on their basis. According to results of physical and chemical research of supports supplied by different producers, an improvement of the industrial technology has been proposed. Preliminary thermal treatment of industrial microspheric products of thermochemical activation of aluminum trihydrate at 550°C until full dehydration of gibbsite and destruction of micropores has been recommended. It has been shown that thermal treatment does not influence the strength of the microgranules of the supports and the catalysts on the basis of them. Alumina-chromia catalysts synthesized employing thermally treated supports are more catalytically active than those based on initial supports. The yield of isobutene in the reaction of isobutane dehydrogenation increases from 40-45 to 44-48 wt %.

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Keywords

alumina-chromia microspherical catalysts, catalyst, microgranules, paraffin dehydrogenation